

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

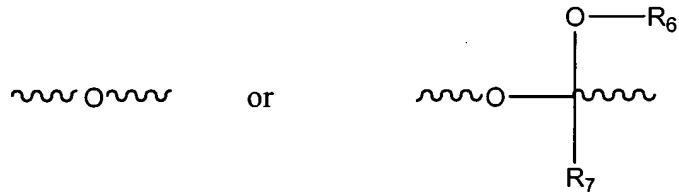
Listing of Claims:

1. (Original) A protected anti-neoplastic agent of the formula Hyp-L-N or Hyp-N, wherein

Hyp is a hypoxic activator;

N is an anti-neoplastic agent; and

L is a linking group of the formula $\sim\sim O \sim\sim X — Y \sim\sim$, where X is selected from



where R₆ is unsubstituted alkyl or alkyl substituted with one or more heteroatom containing groups;

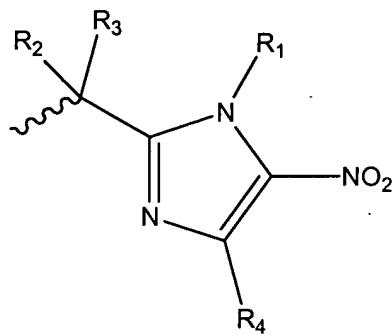
R₇ is hydrogen, unsubstituted alkyl or alkyl substituted with one or more heteroatom containing groups; and

Y is a spacer group selected from a substituted or unsubstituted -(CH₂)_n- chain with n=1-4; a substituted or unsubstituted -(CH₂)_n- chain with n=1-4 in which one of the carbon backbone chain atoms is substituted by a heteroatom containing group; and a delayed release group comprising an aromatic group.

2. (Original) The protected anti-neoplastic agent of claim 1, wherein the hypoxic activator is selected from the group consisting of electron deficient nitrobenzene moieties, electron deficient nitrobenzoic acid amide moieties, nitroazole moieties, nitroimidazole moieties, nitrothiophene moieties, nitrothiazole moieties, nitrooxazole moieties, nitrofuran moieties, and nitropyrrrole moieties.

3. (Original) The protected anti-neoplastic agent of claim 2, wherein the hypoxic activator is a substituted or unsubstituted nitroimidazole moiety.

4. (Original) The protected anti-neoplastic agent of claim 3, wherein the hypoxic activator is a moiety of the formula



wherein

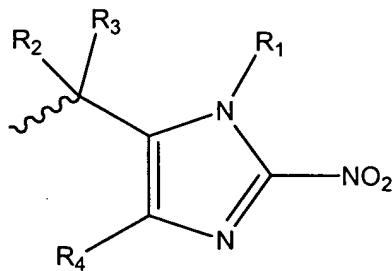
R₂ is hydrogen;

R₃ is hydrogen or C₁-C₆ alkyl;

R₁ is an electron withdrawing group, an unsubstituted C₁-C₆ alkyl, C₁-C₆ alkyl substituted with one or more heteroatom-containing groups, unsubstituted C₁-C₆ alkoxy, or C₁-C₆ alkoxy substituted with one or more heteroatom-containing groups; and

R₄ is an electron withdrawing group, -H, unsubstituted C₁-C₆ alkyl, C₁-C₆ alkyl substituted with one or more heteroatom-containing groups, unsubstituted C₁-C₆ alkoxy, or C₁-C₆ alkoxy substituted with one or more heteroatom-containing groups.

5. (Original) The protected anti-neoplastic agent of claim 3, wherein the hypoxic activator is a moiety of the formula



wherein

R₂ is hydrogen;

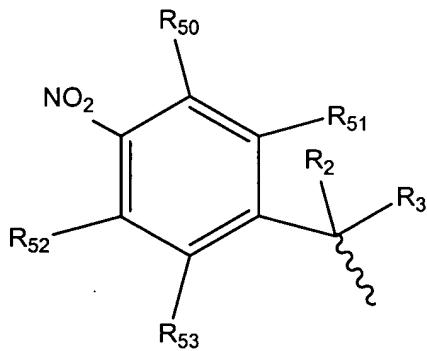
R₃ is hydrogen or C₁-C₆ alkyl;

R₁ is unsubstituted C₁-C₆ alkyl, C₁-C₆ alkyl substituted with one or more heteroatom-containing groups, unsubstituted C₁-C₆ alkoxy, or C₁-C₆ alkoxy substituted with one or more heteroatom-containing groups; and

R₄ is -H, unsubstituted C₁-C₆ alkyl, C₁-C₆ alkyl substituted with one or more heteroatom-containing groups, unsubstituted C₁-C₆ alkoxy, or C₁-C₆ alkoxy substituted with one or more heteroatom-containing groups.

Claims 6-16 (Cancelled).

17. (Original) The protected anti-neoplastic agent of claim 2, wherein the hypoxic activator is a nitrobenzene of formula



where

R₂ is hydrogen;

R₃ is -H, C₁-C₆ alkyl; and

R₅₀, R₅₁, R₅₂, and R₅₃ are independently selected from an electron withdrawing group, H, C₁₋₆ alkyl or C₁₋₆ alkoxy; where the alkyl and alkoxy are optionally independently substituted with one or more groups selected from ether (-OR²⁰), amino (-NH₂), mono-substituted amino (-NR²⁰H), di-substituted amino (-NR²¹R²²), cyclic C₁₋₅ alkylamino, imidazolyl, C₁₋₆ alkylpiperazinyl, morpholino, thiol (-SH), thioether -(SR²⁰), tetrazole, carboxylic acid (-

COOH), ester (-COOR²⁰), amide (-CONH₂), mono-substituted amide (-CONHR²⁰), disubstituted amide (-CONR²¹R²²), N-connected amide (-NH₂-C(=O)-R²⁰), mono-substituted N-connected amide (-NHR²¹-C(=O)-R²⁰), disubstituted N-connected amide (-NR²¹R²²-S(=O)₂-R²⁰), N-connected sulfonamide (-NH₂-S(=O)₂-R²⁰), mono-substituted N-connected sulfonamide (-NHR²¹-S(=O)₂-R²⁰), disubstituted N-connected sulfonamide (-NR²¹R²²-S(=O)₂-R²⁰), sulphony (-S(=O)₂OH), sulphonate (S(=O)₂OR²⁰), sulphonyl (S(=O)₂R²⁰), sulphoxy (S(=O)OH), sulphinate (S(=O)OR²⁰), sulphinyl (S(=O)R²⁰), phosphonoxy (OP(=O)(OH)₂), phosphate (OP(=O)(OR²⁰)₂), and sulfonamide (-S(=O)₂NH₂, -S(=O)₂NHR²¹, or -S(=O)₂NR²¹R²²), where R²⁰, R²¹, and R²² are independently selected from a C₁-C₆ alkyl group; and wherein the electron withdrawing group is selected from halo, cyano (-CN), haloalkyl, carboxamide, nitro, aldehydo (-CHO), keto (-COR²⁰), alkenyl, alkynyl, quaternary amino (-N⁺R²⁰R²¹R²²), ester (-COOR²⁰), amide (-CONH₂), mono-substituted amide (-CONHR²⁰), disubstituted amide (-CONR²¹R²²), N-connected amide (-NH₂-C(=O)-R²⁰), mono-substituted N-connected amide (-NHR²¹-C(=O)-R²⁰), disubstituted N-connected amide (-NR²¹R²²-S(=O)₂-R²⁰), N-connected sulfonamide (-NH₂-S(=O)₂-R²⁰), mono-substituted N-connected sulfonamide (-NHR²¹-S(=O)₂-R²⁰), disubstituted N-connected sulfonamide (-NR²¹R²²-S(=O)₂-R²⁰), sulphony (-S(=O)₂OH), sulphonate (S(=O)₂OR²⁰), sulphonyl (S(=O)₂R²⁰), and sulfonamide (-S(=O)₂NH₂, -S(=O)₂NHR²¹, or -S(=O)₂NR²¹R²²), where R²⁰, R²¹, and R²² are independently a C₁-C₆ alkyl group.

18. (Original) The protected anti-neoplastic agent of claim 1, wherein the anti-neoplastic agent is bonded to the hypoxic activator (Hyp) or linking group (L) through an -O- or -NR₅- group in the anti-neoplastic agent, where R₅ is -H, or C₁-C₆ alkyl, optionally substituted with one or more groups selected from hydroxyl, ether, thiol, thioether, sulfonic ester, sulfoxide, sulfone, sulfonic acid, sulfonic acid ester, sulfenamide, sulfonamide, carboxylic acid, carboxylic acid salt, ester, amide, aldehydo, keto, amino, halo, and cyano.

19. (Original) The protected anti-neoplastic agent of claim 1, wherein the anti-neoplastic agent is selected from the group consisting of doxorubicin, daunorubicin, duocarmycin, etoposide, duetoposide, Combretastatin A-4, vinblastine, vincristine, camptothecin, topotecan, 5-fluorouracil, AQ4N, hydroxyurea, maytansines, enediyenes,

discodermolides, epothilones, taxanes, calicheamicins, tedanolides, bleomycins, calicheamicins, colchicine, cytarabine, dacarbazine, dactinomycin, discodermolides, epirubicin, epirubicin derivatives, fludarabine, hydroxyureapentostatin, 6-mercaptopurine, methotrexate, mitomycin, mitoxantrone, carboplatin, cisplatin, prednisone, procarbazine, taxanes, docetaxel, paclitaxel, tedanolides, teniposide, 6-thioguanine, vinca alkaloids, cyclophosphamides, platinum coordination complexes, anthracenediones, substituted ureas, and methylhydrazine derivatives.

Claim 20 (Cancelled).

21. (Original) The protected anti-neoplastic agent of claim 1, wherein the compound released upon reduction of the hypoxic activator has an IC₅₀ of less than about 100nM.

22. (Original) The protected anti-neoplastic agent of claim 1, wherein the anti-neoplastic agent is bonded to the hypoxic activator (Hyp) or linking group (L) by an -O- group in the anti-neoplastic agent, and wherein the -O- group is bonded to an aromatic group in the anti-neoplastic agent.

Claim 23 (Cancelled).

24. (Original) The protected anti-neoplastic agent of claim 1, wherein R₆ is unsubstituted C₁-C₁₀ alkyl or C₁-C₁₀ alkyl substituted with one or more heteroatom containing groups selected from hydroxyl, ether, thiol, thioether, sulfinic ester, sulfoxide, sulfone, sulfonic acid, sulfonic acid ester, sulfenamide, sulfonamide, carboxylic acid, carboxylic acid salt, ester, amide, aldehydo, keto, amino, halo, and cyano; and

R₇ is hydrogen, unsubstituted C₁-C₁₀ alkyl, or C₁-C₁₀ alkyl substituted with one or more heteroatom containing groups selected from hydroxyl, ether, thiol, thioether, sulfinic ester, sulfoxide, sulfone, sulfonic acid, sulfonic acid ester, sulfenamide, sulfonamide, carboxylic acid, carboxylic acid salt, ester, amide, aldehydo, keto, amino, halo, and cyano.

Claim 25 (Cancelled).

26. (Original) The protected anti-neoplastic agent of claim 1, wherein R₆ is unsubstituted C₁-C₁₀ alkyl; and R₇ is hydrogen or unsubstituted C₁-C₁₀ alkyl.

Claims 27-28 (Cancelled).

29. (Original) The protected anti-neoplastic agent of claim 1, wherein the spacer group Y is an unsubstituted -(CH₂)_n- chain with n=1-4, or a -(CH₂)_n- chain with n=1-4 substituted with one or more heteroatom containing groups selected from hydroxyl, ether, thiol, thioether, sulfinic ester, sulfoxide, sulfone, sulfonic acid, sulfonic acid ester, sulfenamide, sulfonamide, carboxylic acid, carboxylic acid salt, ester, amide , aldehydo, keto, amino, halo, and cyano.

Claims 30-38 (Cancelled).

39. (Original) The protected anti-neoplastic agent of claim 1, wherein X is the acetal group and Y is -(CR^eR^f)-R^m-(CR^jR^k)-(CH₂)-, where R^e, R^f are independently hydrogen, unsubstituted C₁-C₃ alkyl, C₁-C₃ alkyl substituted with one or more of hydroxyl, ether, thiol, thioether, sulfinic ester, sulfoxide, sulfone, sulfonic acid, sulfonic acid ester, sulfenamide, sulfonamide, carboxylic acid, carboxylic acid salt, ester, amide , aldehydo, keto, amino, halo, and cyano, or (CR^eR^f) is (C=O); R^j and R^k are independently hydrogen, unsubstituted C₁-C₃ alkyl, C₁-C₃ alkyl substituted with one or more of hydroxyl, ether, thiol, thioether, sulfinic ester, sulfoxide, sulfone, sulfonic acid, sulfonic acid ester, sulfenamide, sulfonamide, carboxylic acid, carboxylic acid salt, ester, amide , aldehydo, keto, amino, halo, and cyano, or (CR^jR^k) is (C=O); and R^m is selected from -O-, -S-, -S(=O)₂-, and -NR³⁰-, where R₃₀ is selected from -C(=O)R³¹-, -C(=O) NR³¹ R³²-, -H, C₁-C₁₀ alkyl or C₁-C₁₀ alkyl substituted with one or more heteroatom containing groups selected from hydroxyl, ether, thiol, thioether, sulfinic ester, sulfoxide, sulfone, sulfonic acid, sulfonic acid ester, sulfenamide, sulfonamide, carboxylic acid, carboxylic acid salt, ester, amide , aldehydo, keto, amino, halo, and cyano; and R³¹ and R³² are independently selected from C₁-C₁₀ alkyl or C₁-C₁₀ alkyl substituted with one or more heteroatom containing groups, selected from hydroxyl, ether, thiol, thioether, sulfinic ester,

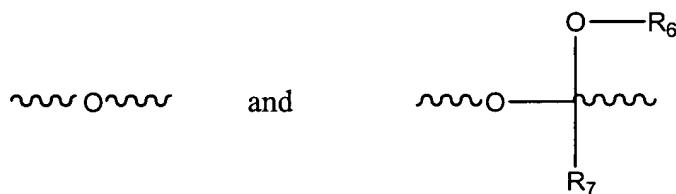
sulfoxide, sulfone, sulfonic acid, sulfonic acid ester, sulfenamide, sulfonamide, carboxylic acid, carboxylic acid salt, ester, amide , aldehydo, keto, amino, halo, and cyano.

Claim 40 (Cancelled).

41. (Original) The protected anti-neoplastic agent of claim 1, wherein Y is the delayed release group and has the formula $\sim\sim R_{10}—R_{11}—R_{12}\sim\sim$ where R_{10} is a bond ; R_{11} is an unsubstituted or substituted aryl or heteroaryl group; and R_{12} has the formula $—(CR^{40}R^{41})—R^{42}—$ or $—(CR^{40}R^{41})—CR^{43}=CR^{44}—R^{42}—$, where R^{42} is a bond or $-OC(=O)-$, and R^{40} , R^{41} , R^{42} , and R^{43} are independently selected from -H, unsubstituted C₁-C₁₀ alkyl, and C₁-C₁₀ alkyl substituted with one or more heteroatom containing groups selected from hydroxyl, ether, thiol, thioether, sulfinic ester, sulfoxide, sulfone, sulfonic acid, sulfonic acid ester, sulfenamide, sulfonamide, carboxylic acid, carboxylic acid salt, ester, amide , aldehydo, keto, amino, halo, and cyano.

Claims 42-52 (Cancelled).

53. (Original) A protected anti-neoplastic agent, in which the anti-neoplastic agent includes one or more protectable hydroxyl groups or amine groups, and wherein one or more of the protectable hydroxyl groups or amine groups is substituted with a group selected from Hyp-L- or Hyp-, wherein Hyp is a hypoxic activator; and L is a linking group of the formula $\sim\sim X—Y\sim\sim$, where X is selected from



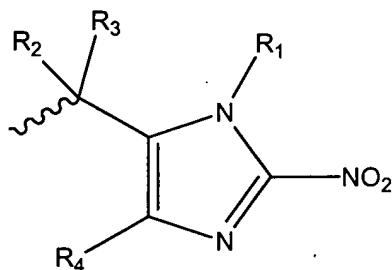
where R_6 is unsubstituted alkyl or alkyl substituted with one or more heteroatom containing groups;

R_7 is hydrogen, unsubstituted alkyl or alkyl substituted with one or more heteroatom containing groups; and

Y is a spacer group selected from a substituted or unsubstituted -(CH₂)_n- chain with n=1-4; a substituted or unsubstituted -(CH₂)_n- chain with n=1-4 in which one of the carbon backbone chain atoms is substituted by a heteroatom containing group; and a delayed release group comprising an aromatic group.

54. (Original) The protected anti-neoplastic agent of claim 53, wherein the hypoxic activator is selected from the group consisting of electron deficient nitrobenzene moieties, electron deficient nitrobenzoic acid amide moieties, nitroazole moieties, nitroimidazole moieties, nitrothiophene moieties, nitrothiazole moieties, nitrooxazole moieties, and nitrofuran moieties, and nitropyrrole moieties.

55. (Original) The protected anti-neoplastic agent of claim 54, wherein the hypoxic activator is a nitroimidazole of the formula



wherein

R₂ is hydrogen;

R₃ is -H or C₁-C₆ alkyl;

R₁ is substituted or unsubstituted C₁-C₆ alkyl or substituted or unsubstituted C₁-C₆ alkoxy; and

R₄ is -H, substituted or unsubstituted C₁-C₆ alkyl, or substituted or unsubstituted C₁-C₆ alkoxy;

wherein the R₁ and R₄ substituted alkyl and substituted alkoxy are independently substituted with one or more heteroatom-containing groups selected from ether (-OR₂₀), amino

(-NH₂), mono-substituted amino (-NR₂₀H), di-substituted amino (-NR₂₁R₂₂), cyclic C₁-5 alkylamino, imidazolyl, C₁-6 alkylpiperazinyl, morpholino, thiol (-SH), thioether -(SR₂₀), tetrazole, carboxylic acid (-COOH), ester (-COOR²⁰), amide (-CONH₂), mono-substituted amide (-CONHR²⁰), disubstituted amide (-CONR²¹R²²), N-connected amide (-NH₂-C(=O)-R²⁰), mono-substituted N-connected amide (-NHR²¹-C(=O)-R²⁰), disubstituted N-connected amide (-NR²¹R²²-S(=O)₂-R²⁰), N-connected sulfonamide (-NH₂-S(=O)₂-R²⁰), mono-substituted N-connected sulfonamide (-NHR²¹-S(=O)₂-R²⁰), disubstituted N-connected sulfonamide (-NR²¹R²²-S(=O)₂-R²⁰), sulphoxy (-S(=O)₂OH), sulphonate (S(=O)₂OR²⁰), sulphonyl (S(=O)₂R²⁰), sulphixy (S(=O)OH), sulphinate (S(=O)OR²⁰), sulphinyl (S(=O)R²⁰), phosphonoxy (OP(=O)(OH)₂), phosphate (OP(=O)(OR²⁰)₂), and sulfonamide (-S(=O)₂NH₂, -S(=O)₂NHR²¹, or -S(=O)₂NR²¹R²²), where R²⁰, R²¹, and R²² are independently selected from a C₁-C₆ alkyl group; and

L is a linking group of the formula $\sim\sim X — Y \sim\sim$, where X is selected from R₆ is unsubstituted C₁-C₃ alkyl or C₁-C₃ alkyl substituted with one or more heteroatom containing groups selected from hydroxyl, ether, thiol, thioether, sulfinic ester, sulfoxide, sulfone, sulfonic acid, sulfonic acid ester, sulfenamide, sulfonamide, carboxylic acid, carboxylic acid salt, ester, amide, aldehydo, keto, amino, halo, and cyano;

R₇ is hydrogen, unsubstituted C₁-C₃ alkyl, or C₁-C₃ alkyl substituted with one or more heteroatom containing groups selected from hydroxyl, ether, thiol, thioether, sulfinic ester, sulfoxide, sulfone, sulfonic acid, sulfonic acid ester, sulfenamide, sulfonamide, carboxylic acid, carboxylic acid salt, ester, amide, aldehydo, keto, amino, halo, and cyano; and

the spacer group Y is an unsubstituted -(CH₂)_n- chain with n=1-4, or a -(CH₂)_n- chain with n=1-4 substituted with one or more heteroatom containing groups selected from hydroxyl, ether, thiol, thioether, sulfinic ester, sulfoxide, sulfone, sulfonic acid, sulfonic acid ester, sulfenamide, sulfonamide, carboxylic acid, carboxylic acid salt, ester, amide, aldehydo, keto, amino, halo, and cyano; or

the spacer group Y is the delayed release group and has the formula $\sim\sim R_{10} — R_{11} — R_{12} \sim\sim$ where R₁₀ is a bond ; R₁₁ is an unsubstituted or substituted aryl or substituted or unsubstituted heteroaryl group; and R₁₂ has the formula -(CR₄₀R₄₁)-R₄₂- or -

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Preliminary Amendment

PATENT

(CR40R41)-CR43=CR44-R42- , where R42 is a bond or -OC(=O)-, and R40, R41, R42, and R43 are independently selected from -H, unsubstituted C1-C10 alkyl, and C1-C10 alkyl substituted with one or more heteroatom containing groups selected from hydroxyl, ether, thiol, thioether, sulfinic ester, sulfoxide, sulfone, sulfonic acid, sulfonic acid ester, sulfenamide, sulfonamide, carboxylic acid, carboxylic acid salt, ester, amide , aldehydo, keto, amino, halo, and cyano.

Claims 56-63 (Cancelled).

64. (Currently amended): A method for treating cancer comprising administering to a subject a therapeutically effective amount of a protected anti-neoplastic agent according to claim 1 any of claims 1 and 53.

Claims 65-87 (Cancelled).

88. (New): A method for treating cancer comprising administering to a subject a therapeutically effective amount of a protected anti-neoplastic agent according to claim 53.